COMMENTS OF
THE INTERNATIONAL COUNCIL OF SHOPPING CENTERS
ON THE
DRAFT CHESAPEAKE BAY TMDL

Re: Docket Number EPA-R03-OW-2010-0736

The International Council of Shopping Centers respectfully submits these comments on the Draft Chesapeake Bay Total Maximum Daily Load as released for public comment by the U.S. Environmental Protection Agency on September 24, 2010 at 75 Fed. Reg. 57776 (Sept. 22, 2010).

INTRODUCTION

The name "Chesapeake" was derived from the Native American word "Tschiswapeki" which loosely translates as "great shellfish bay."[1] Sadly, this name has become a modern misnomer as the current oyster population is estimated to be only one percent of pre-civilization levels.

To the uninformed, it may seem "obvious" that land use changes in the Chesapeake Bay watershed, together with overfishing, are responsible for the decline in oysters. Yet the facts strongly indicate that overharvesting (starting approximately 150 years ago – long before the regional increase in the human population during the 20th Century) and direct habitat destruction by dredging in the Bay are the primary factors and "proximate cause" of the decline in oyster populations.[2]

Equally important as we consider the Draft TMDL, ***the decline in the oyster population is directly responsible for much of the reduced water quality of the Bay itself***. It is a well-established scientific fact that the native Eastern oyster (*Crassostrea virginica*) was the keystone species in the Bay.[3] In ecological terms, this means that the oyster population was the primary influence over the extent and quality of the Bay's habitat. Removing the oysters directly resulted in a decline in the amount of habitat and a reduction in the water quality available for all other species in the Bay.

Thus, in ecological (as well as legal) terms, EPA's approach to restoring water quality in the Chesapeake Bay has it precisely backwards – reducing the nutrient runoff in the Chesapeake Bay will not result in a restoration of the populations of oysters and other filter feeders and, therefore, cannot achieve overall water quality standards. In contrast,

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[1] Source: Chesapeake Bay Foundation Fact Sheet. Accessed November 3, 2010 at http://www.cbf.org/Page.aspx?pid=433.

[2] See, for example: "Decline of the Chesapeake Bay Oyster Population: A Century of Habitat Destruction and Overfishing" by B.J. Rothschild, et al., Marine Ecology Progress Series, Volume 111: 29-39. 1994.

[3] U.S. Fish and Wildlife Service Chesapeake Bay Oyster Reef Habitat Initiative web site. Accessed November 5, 2010 at http://www.fws.gov/chesapeakebay/OysterInitiative.html.

restoration of the oyster population (along with other native filter feeders) will, in fact, result in a reduction of the pollution levels in the Bay. Yet EPA has not produced any estimates of the relative contributions of these critical factors that underpin water quality in the Bay despite a requirement under the applicable law to provide to the public a transparent analysis of all significant causative factors. [For technical analysis, please refer to Appendix A.]

As a result, ***the Draft TMDL is an arbitrary and capricious Agency action that seeks to improperly impose land use restrictions (directly and indirectly) on State and local jurisdictions and private property owners within the larger Chesapeake Bay watershed.***

THE IMPORTANCE OF THE OYSTER

According to the Chesapeake Bay Foundation:

> *Oysters purify the Chesapeake Bay as they filter the water for their food. An adult oyster can filter as much as 50 gallons of water a day.*
>
> *Sediment and nitrogen cause problems in Bay waters. Oysters filter these pollutants either by consuming them or shaping them into small packets, which are deposited on the bottom where they are not harmful.*
>
> *The oysters in the Bay could once filter a volume of water equal to that of the entire Bay (about 19 trillion gallons) in a week. Today, it would take the remaining Bay oysters more than a year.*[4]

The National Oceanic and Atmospheric Administration agrees:

> *Oysters are filter feeders, consuming phytoplankton (free-swimming algae) and improving water quality while filtering the water for food. As generations of oysters settle on top of each other and grow they form reefs that provide structured habitat for many fish species and crabs. The Chesapeake Bay was once known for its abundance of oysters. Much of their recent decline was due to decades of overharvest and habitat destruction. More recently two parasitic diseases, MSX and Dermo,*

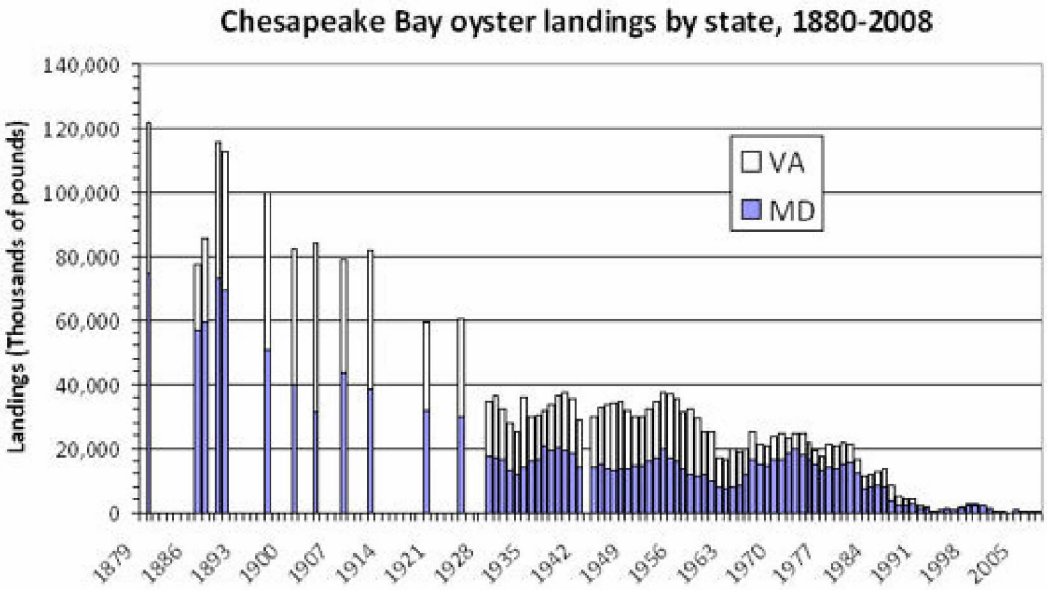
[4] Chesapeake Bay Foundation's OYSTER FACT SHEET. Accessed November 3, 2010 at http://www.cbf.org/Page.aspx?pid=511.

have devastated the remaining oyster populations in most areas of the Bay and its tributaries.[5]

Yet the impact of oysters on the Bay's ecology was not solely due to their prodigious capacity to filter the water and remove pollutants. Undisturbed oyster beds grew into enormous shell reefs which played a role in the Chesapeake Bay analogous to that of tropical water coral reefs.

Bay oysters used to grow in tall reefs that were much better for the Bay than today's flat oyster beds. The reefs were elevated, which kept oysters above the silty bottom and exposed them to food-rich currents above. The healthy oyster reefs of 100 years ago were so large that they were considered navigational hazards.[6]

As can be seen from the following bar graph[7], oyster populations were decimated long before the major modern development in urban and suburban areas of the Bay watershed.



In particular, note that the period selected by EPA as the "baseline" for its **TMDL modeling corresponds to historically low levels of oysters in the Bay**. EPA concedes that all of "***The models used to develop the Chesapeake Bay TMDL simulate the same 10-year hydrologic period from 1991 to 2000.***"[8] [Emphasis added]

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[5] Quotation from the NOAA Oyster Reef web page. Accessed November 5, 2010 at http://chesapeakebay.noaa.gov/oysters/oyster-reefs.
[6] *Ibid.*
[7] Graph from NOAA Fish Facts web page. Accessed on November 5, 2010 at http://chesapeakebay.noaa.gov/fish-facts/oysters.
[8] Draft Chesapeake Bay TMDL, SECTION 5: Chesapeake Bay Monitoring and Modeling Frameworks at page 5-15.

The current Draft TMDL simply fails to provide sufficient information to the public to determine whether EPA properly understands the role of oysters in the Bay – either in terms of historical importance in the past or potential importance in the future. Yet ***this information is crucial to the design of any plan to achieve water quality standards for the Bay***. Consider this statement on the importance of oysters in the Bay:

> *The Bay's oyster population has severely declined over the past century due to over-harvesting, which removed huge volumes of oysters. Over-harvesting also led to the demise of the Bay's healthy oyster reefs, which were scraped away by dredging. Oyster beds are now usually limited to a flat, thin layer of dead shells and live oysters spread widely over the Bay's bottom.*
>
> *These damaged habitats:*
>
> - *Offer less surface area for oyster spat and other reef-dwelling invertebrates to attach themselves to. This impacts larger fish and blue crabs that live and breed around oyster reefs and prey upon these smaller species.*
>
> - *Are easily covered by sediment, which smothers live oysters and can eventually bury a damaged reef.*
>
> *... In addition to harvest pressure, the Bay's oysters face a number of other challenges. One of these is disease. Since the 1950s, the oyster diseases MSX and Dermo have decimated the Bay's remaining oyster population.*
>
> *The Bay's oysters have also been impacted by poor water quality.*[9]

Thus, although land use changes during the past 100 years may have had *an additional impact* on oyster populations in the Bay **it is arbitrary and capricious to assume the majority of water quality impairments arise from land use changes**, as the current draft TMDL apparently does.

The lack of formal property rights on the original oyster bars of the Chesapeake Bay (and, therefore, the inability of individual oystermen to exclude competitors) led directly to the overharvesting of this resource and a classic "tragedy of the commons" situation.[10] It would be ironic if the ecological problems created by this absence of property rights in the Bay itself led EPA to ignore the legitimate property rights of landowners in the

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[9] Chesapeake Bay Program: Oyster Harvest. Web page accessed November 5, 2010 at http://www.chesapeakebay.net/oysterharvest.aspx?menuitem=14701.

[10] *The Tragedy of the Commons* by Garrett Hardin. **Science** (162:1243-1248) 1968.

surrounding watershed who have fully complied with the laws and regulations of their local jurisdictions for over a century.

In its Draft TMDL EPA indicates that it has considered various scenarios for pollution flowing into the Bay. However, EPA has not provided any estimate for the impact of filter feeders on pollution levels. Filter feeders (primarily oysters) do not play a role in the TMDL calculations despite the fact that their absence is the *sine qua non* for much, perhaps most, of the nutrient buildup in the Bay. The Draft TMDL acknowledges this failure when it says:

> *EPA's intention is to base the TMDL on the current population of filter feeders. Potential future population changes would not be accounted for in the TMDL.*[11]

It then suggests that future modifications to 2-year milestones for states are possible if they are able to increase the oyster population.[12] That is as far as EPA goes in its "analysis" of perhaps the single most important factor for nitrogen, phosphorus, chlorophyll *a* and dissolved oxygen levels in the Bay. [Please refer to Appendix A]

In other words, **EPA has not fully established the cause-and-effect of Bay water quality impairment** yet it seeks to impose extremely high costs on landowners and municipalities by requiring them to provide all mitigation efforts. Much of the projected expense of implementing this TMDL would come from new land-based water filtering systems – even as EPA has ignored the historical role played by oysters in maintaining the Bay's water quality. The Draft TMDL asserts that stormwater runoff is the primary source of impairment of the Bay's ecology when, in fact, prior overharvesting of oysters reduced the natural filtering capacity of the Bay to such an extent that otherwise harmless levels of sediment/nutrients just "sit there" until they can trigger a host of other water quality problems. EPA should be required to calculate a specific level of oyster restoration (or range of possible levels) that must be reached ***before*** it imposes Bay-wide TMDL targets for stormwater runoff. Chesapeake Bay water quality levels are too dependent upon the oyster population to ignore the issue to this degree.

Unless and until the oysters are restored to some significant fraction of historical populations the Bay will never return to a balanced, healthy ecosystem. The initial cause of the water quality impairment was overharvesting of oysters and physical destruction of in-Bay habitat – not runoff from commercial and residential development or land-based agricultural practices. Even if the degree to which water quality depends upon oysters is uncertain, ***EPA cannot provide any reasonable estimate of proportionate responsibility without conducting a detailed and transparent analysis of the oyster population and its historic interaction with the Bay's water quality***. Thus far, EPA has failed to conduct this necessary analysis and, therefore, has produced a severely flawed Draft TMDL. Appendix A of these Comments provides a technical analysis by LimnoTech that further addresses EPA's inadequate efforts to incorporate filter feeders in the Draft TMDL.

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[11] Draft TMDL Appendix U: Filter Feeders White Paper at page U-4.

[12] See Draft TMDL Section 10.7 at page 10-8. Section 10.7 is all of two paragraphs long.

CONCLUSION

EPA has not demonstrated to what extent the independent decline in the oyster population is responsible for the decrease in dissolved oxygen or the increase in chlorophyll *a*, nitrogen, phosphorus or sediment. Thus it cannot logically assert any numerical relationship between land-based stormwater run-off and nutrient levels measured in the Bay. Merely mentioning filter feeders in the Draft TMDL is not sufficient to discharge this statutory requirement. To issue a TMDL without first producing these calculations for public review and comment would violate the Administrative Procedures Act (5 U.S.C. 553(c)) and the prohibition against arbitrary and capricious Agency actions (5 U.S.C. § 706(2)(A)).

Therefore, **EPA should immediately withdraw its Draft TMDL and reissue it for public comment only after it has concluded the necessary analysis and transparently included those results in its TMDL assumptions**.

Respectfully submitted this, the 8th day of November, 2010 by Kent Jeffreys on behalf of the International Council of Shopping Centers.

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Founded in 1957, the International Council of Shopping Centers is the premier global retail real estate trade association. ICSC's approximately 50,000 members in the United States include shopping center owners, developers, property managers, marketing specialists, investors, retailers and brokers. ICSC members with properties and other interests in the watershed of the Chesapeake Bay would be directly and negatively impacted by implementation of the Draft TMDL.

APPENDIX A

ANALYSIS OF THE ROLE OF FILTER FEEDERS IN THE DRAFT CHESAPEAKE BAY TMDL

Docket Number EPA-R03-OW-2010-0736

LimnoTech
November 8, 2010

The draft Total Maximum Daily Load (TMDL) for total nitrogen (TN), total phosphorus (TP), and sediment in the Chesapeake Bay is deficient because it does not adequately inform the public of the important role that increased stocks of filter feeders could play in establishing and implementing the TMDL. Indeed, Appendix U of the draft TMDL understates the potential benefits of increased stocks of filter feeders because it is incomplete and relies on outdated information.

EPA should revise the draft TMDL to provide updated information about the beneficial impacts of filter feeders using the current Watershed Model and Water Quality Sediment Transport Model (WQSTM). EPA (to our knowledge) has not produced simulations of the benefits of filter feeders using the current models. Even if EPA does not have current model results, EPA should provide the information showing the benefits of filter feeders using previous versions of the models. This is necessary so that the public can properly review and fully comment on the draft TMDL and the Watershed Implementation Plans (WIPs). For example, EPA should show the public which segments could fully attain water quality standards[1] with a modest level of restoration of filter feeders. EPA should provide a simulation to show how a modest level of restoration could reduce the onerous reductions in nutrients and sediment loads required in Scenario E3[2].

EPA should also provide a full and transparent explanation in the draft TMDL as to why none of the scenarios conducted for the TMDL represented filter feeders at populations that are greater than their current levels. Accounting for restoration of filter feeders (not just oysters) as nutrient and sediment loads are reduced, has no less reasonable assurance than other assumptions EPA has employed in the draft TMDL (and for all potential final TMDLs presented by EPA). For example, Scenario E3 should include concerted efforts to restore filter feeders to the

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[1] Water quality standards for the Chesapeake Bay include dissolved oxygen, chlorophyll *a*, and clarity. It is important to note that these standards were established to protect aquatic life (such as oysters) in the Bay and its tidal tributaries. If there are other limiting factors (such as lack of habitat or toxic pollution in sediments), restoring water quality to these standards will not necessarily equate to increases in aquatic life.

[2] "The E3 [everything, everywhere, everyone] scenario is a 'what-if' scenario of watershed conditions with theoretical maximum levels of managed controls on all pollutant load sources. There are no cost and few physical limitations to implementing BMPs [best management practices] for point and nonpoint sources in the E3 scenario" (see draft TMDL page J-4).

maximum extent practicable, even if that means relying on emerging and new technologies[3]. It is unclear why the nutrient load reduction targets for Scenario E3 cannot be different if modest improvements in filter feeders would justify lower nutrient load reductions.

EPA should also acknowledge that additional work is needed to adequately address concerns raised during Chesapeake Bay Program meetings about the effect of filter feeders on nutrient and sediment allocations in the TMDL and the WIPs. This includes ensuring that resources will be directed to adequately determine load reduction adjustments if future monitoring data indicate changes in filter feeder populations during the 2-year milestones. It also means ensuring that data are available, including updated tools, to address these concerns prior to the 2011 and 2017 updates of the TMDL.

Updated information on the benefits of increased stocks of filter feeders would also provide information that could be used to evaluate whether a Use Attainability Analysis (UAA) is needed to determine the highest attainable uses for the Chesapeake Bay and its tidal tributaries. Under the UAA, the economic impact of attaining scenarios like E3 can be considered. EPA was considering the potential need for a UAA until 2009[4,5]. Conducting a UAA would not be a license for "more pollution" or letting hypoxia levels remain at the status quo. Instead, defining the maximum dollars available for restoration in 3-year (not 2-year) increments[6], could result in development of realistic (yet still aggressive) WIPs and more specific (and achievable) milestones for load reductions and ecological restoration. This would allow the federal and state agencies and people that work and live in the Bay watershed to target scarce resources towards programs to maximize ecological and economic benefits, and experiment with new technologies. The UAA would be re-visited every three years during the State's triennial reviews, as required under the Clean Water Act.

It should be noted that a complete review of this issue was difficult within the shortened timeframe of the public comment period[7]. Information presented here is not complete, in particular because documentation on the version of the Chesapeake Bay WQSTM used for the draft TMDL is not available.

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[3] It is our understanding that Scenario E3 assumes that oysters and menhaden, as well as other (unspecified) filter feeders, are represented at current populations. For oysters, this means that populations are at 1 percent of their historic levels.

[4] The specific date as to when any concept of a Use Attainability Analysis (UAA) for the Bay was dropped is unclear. The minutes of the June 16, 2009 Quarterly Meeting of the Chesapeake Bay Program's Scientific and Technical Advisory Committee attribute the following statement to J. Charles (Chuck) Fox, EPA Senior Advisor: "We did a use-attainability analysis about five years ago and it is an enormous suck of energy. This should always be up for consideration, but given the realities of the day and lack of progress and public knowledge, we need to see how far we can get in the next few years." http://www.chesapeake.org/stac/MeetInfo/june09mins.pdf

[5] Contrary to Mr. Fox's statement that EPA did a UAA five years ago, EPA did not evaluate the widespread social and economic factor which can be used to issue a variance or revise the water quality standards.

[6] The Clean Water Act requires that States conduct triennial reviews of their water quality standards every three years. EPA should revise their 2-year milestone deadlines to coincide with the States' triennial review dates to ensure efficiencies in the Bay TMDL process.

[7] EPA has continued to reduce the time for public review (see November 3, 2009 letter from William C. Early to Secretary Bryant where the anticipated 90-day public comment period was reduced to 60 days). EPA then reduced the public comment period on the draft TMDL to November 8, 2010 which allowed for only a 45-day review period.

ADDITIONAL CONSIDERATIONS

A. EPA obviously understands and recognizes the importance and inter-relationships between water quality and filter feeders. The targets (i.e. water quality standards) in the draft TMDL are, in part, to ensure that water quality conditions are sufficient to restore and protect these filter feeders. EPA should therefore document in the TMDL how restoring filter feeders can achieve the same desired water quality in combination with load reductions.

Since 2002, the Chesapeake Bay Program has directed significant resources into developing tools to understand the beneficial impact of restoring filter feeders[8,9]. EPA apparently decided in April 2010 that the benefits of restoring filter feeders could not be considered in the TMDL and that States and the District of Columbia should not be able to count on taking credit for these impacts in their WIPs [10]. This is confusing and at apparent counter-purposes for incorporating the effects of filter feeders in the WQSTM. The developers of the water quality model[11] (WQM) stated:

> "Our model agrees with a wide body of evidence that bivalves can modify their local environment. When bivalves are confined to only a small portion of bottom area, their ability to transform an entire estuarine system is limited. In view of the enormous cost and technological difficulties associated with controlling external loads, DO [dissolved oxygen] improvements on the order of tenths of a g m^{-3} [gram per cubic meter] and nitrogen removal on the order of 10% of system loading cannot be disparaged. These improvements have economic and ecological values and are to be encouraged" (Cerco and Noel, 2007, page 341).

EPA and the Chesapeake Bay Program were apparently considering including the effects of enhanced filter feeder (specifically menhaden and oyster) populations in the TMDL until the April 5-6, 2010 Water Quality Goal Implementation Team meeting, when this was abandoned. At this meeting, EPA presented its position that it was "not willing to project increase in population" (see Minutes[12] page 14). It should be noted that the tenfold and fiftyfold oyster scenarios with the current models were still pending as of the March 31, 2010 Quarterly

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[8] Scientific and Technical Advisory Committee (STAC). December 2002. *Suspension feeders: A Workshop to Assess What We Know, Don't Know, and Need to Know to Determine Their Effects on Water Quality.* March 18-19, 2002. BWI Ramada Inn, Hanover, Maryland. Chesapeake Bay Program.

[9] The latest publication on incorporation of filter feeders into the Chesapeake Bay modeling tool is Cerco and Noel, 2010.

[10] See minutes of the April 5-6, 2010 meeting of the Chesapeake Bay Program Water Quality Goal Implementation Team at Presentation F.
http://archive.chesapeakebay.net/calendar.cfm?EventDetails=10559&DefaultView=all&RequestDate=04/01/2010

[11] The water quality model (WQM) used by Cerco and Noel (2005, 2007, and 2010) is an earlier version of the WQSTM.

[12] Minutes of the April 5-6, 2010 Water Quality Goal Implementation Team meeting are located at http://archive.chesapeakebay.net/pubs/calendar/47043_04-05-10_Minutes_1_10559.pdf .

Modeling Subcommittee meeting. It would have been interesting to have seen at least some of the WQSTM results in the presentation that EPA used at the April 5-6, 2010 meeting[13].

Section 10.7 of draft TMDL acknowledges that filter feeders play an important role in the uptake of nitrogen and phosphorus. It fails, however, to provide a numeric allocation related to this uptake level. Nor does the draft TMDL acknowledge the benefits of filter feeders in reducing turbidity, particularly as to how the filter feeders can contribute to increases in submerged aquatic vegetation (SAV). The developers of the water quality model state "[o]ur model indicates enhanced SAV abundance is the most significant improvement to be attained through oyster restoration…The effectiveness of oysters in SAV restoration is attributed to the close proximity of oysters to the SAV beds" (Cerco and Noel, 2007, page 340).

Section 10.7 of the draft TMDL also limits discussion to the native Eastern oyster (market size) and menhaden fish. This section does not address the importance of other bivalves that are included in the WQSTM (namely *Corbicula* and *Rangia*) or important filter feeders that are not yet in the model (such as *Macoma balthica* or polychaete *Chaetoperus* cf. *variopedatus*). The water quality model developers make a compelling case that *Macoma balthica* and *Chaetoperus* cf. *variopedatus* (deemed OTFF in modeler's lingo) "should be modeled in oligohaline regions throughout the system" and that these two species "can exert substantial control on phytoplankton populations" (Cerco and Noel, 2010, page 1063). The developers further state:

> "This activity has significant management implications in view of the attention paid to reducing chlorophyll concentrations via management of nutrient loads. Apart from direct controls on phytoplankton, OTFF contribute indirectly to eutrophication reduction by trapping carbon and nutrients in the upper, oxygenated portions of the estuaries, rather than allowing the material to pass to the lower estuaries where carbon contributes to bottom-water hypoxia and nutrients fuel phytoplankton production which clouds the water and contributes additional organic matter to the bottom.
>
> Loss of filtering capacity in Chesapeake Bay has been blamed for the eutrophication there (Newell, 1988) and restoration of bivalves is being explored as a management strategy (US Army Engineers, 2008). Restoration focuses primarily on native and exotic oysters (*C. virginica* and *ariakensis*) which have been the subject of extensive studies (Newell et al., 2002; Porter et al., 2004; Cerco and Noel, 2007). Less attention has been devoted to the ecological role of other bivalve filter feeders although these apparently already play a role in eutrophication control. Perhaps the lack of attention is due to the lack of commercial importance of these species. Clearly, the role of OTFF should be included in management models and their importance should be recognized in management activities." (p. 1063)

It should also be noted that there could be localized repercussions of dramatic reductions of nutrient loads. This phenomenon has adversely affected salmon populations in British

[13] EPA prepared a slide (with no data) for the April 5-6, 2010 to demonstrate the relationship between filter feeders and nutrient reductions. See slide 9 at http://archive.chesapeakebay.net/pubs/calendar/47043_04-05-10_Presentation_4_10559.pdf

Columbia and elsewhere[14]. The draft TMDL does not discuss the possibility of local aquatic resources being "starved" of nutrient or sediment loads, if the reductions that are called for are greater than they should be from a local, biological perspective.

Finally, the draft TMDL does not even discuss the oyster management plan adopted by the Chesapeake Bay Program in 2005[15]. The TMDL should have included an alternate TMDL that incorporates the oyster restoration goal (or the oyster management plan should be revised to reflect that EPA does not consider even modest increases in oysters as a realistic management objective).

EPA has not demonstrated in the draft TMDL that it acknowledges that water quality improvements associated with reductions in nutrient and sediment loads will positively affect filter feeder populations, which will then reduce the need for nutrient and sediment load reductions. EPA could have easily produced an alternate TMDL that showed the public the allocations for nutrients and sediments if filter feeders were restored to even a modest level.

B. Appendix U appears to rely on spurious or out-dated information and understates the potential benefit of increasing oyster populations on total nitrogen in the Bay.

Appendix U does not cite the most up-to-date documentation about the filter feeders that are in the current version of the WQSTM that is being used by EPA for the draft TMDL. Appendix U needs to be re-written and re-issued for public review and comment. LimnoTech identified three publications (Cerco and Noel, 2005; Cerco and Noel, 2007; and Cerco and Noel, 2010) that provide more up-to-date and complete information on the incorporation of filter feeders in the WQSTM. These publications show that Appendix U understates the potential benefit of a tenfold increase in oyster populations on reducing the need to obtain the TN load reductions in EPA's draft TMDL.

Appendix U cites a reference to a presentation by Dr. Cerco to the October 2005 Quarterly Meeting of the Chesapeake Bay Program Modeling Subcommittee, where the tenfold increase in native oysters "could remove 10 million pounds of nitrogen annually" (see draft TMDL, page U-2). LimnoTech could not verify this statistic based on Dr. Cerco's presentation or the meeting minutes where he presented this information[16]. The version of the model presented in 2005 is not even the WQSTM that is being used for the TMDL. Nevertheless, 10 million pounds is 5 percent of the total basin/jurisdiction draft allocation of 187.44 million pounds (see draft TMDL, Table ES-1). Five percent is not insignificant when EPA is proposing "Moderate-level backstop allocations" to provide "[a]dditional adjustments to agriculture

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[14] Pellett, K. (2008) Salmon River Nutrient Enrichment for Fish Habitat Restoration, 2008; Report prepared by BCCF for BC Ministry of Environment Fisheries Section, Nanaimo, British Columbia; BC Hydro Bridge Coastal Restoration Program, Burnaby, British Columbia; Western Forest Products Forest Investment Account; and Georgia Basin/Vancouver Island Living Rivers; https://www.bchydro.com/bcrp/projects/docs/08.CBR.05.pdf.

[15] See the 2004 Chesapeake Bay oyster management plan at http://www.chesapeakebay.net/oystersmanagement.aspx?menuitem=14770 . This document is listed in the draft TMDL as a reference but is never discussed.

[16] The materials for the October 2005 Quarterly Meeting of the Modeling Subcommittee are located at http://archive.chesapeakebay.net/calendar.cfm?EventDetails=5980&DefaultView=all&RequestDate=10/1/2005 . Dr. Cerco's presentation is entitled *Status and Progress of the hydrodynamic and water quality models.*

nonpoint sources as necessary to exactly meet nitrogen, phosphorus and sediment allocations" (see draft TMDL, page x, emphasis added).

The Cerco and Noel 2005 and 2007 publications provide an estimated 30,000 kilograms per day (or 24 million pounds per year) reduction in nitrogen from a tenfold increase in oysters. This is 13 percent of the draft allocation, which is even more significant than five percent.

Finally, as discussed above, Appendix U does not acknowledge the existence and potential benefits of other critical filter feeders in the Bay, such as *Macoma balthica* or polychaete *Chaetoperus* cf. *variopedatus*.

C. Statements in the "Other Issues of Concern" demonstrate how EPA is being inflexible in its efforts to produce a TMDL to restore the Bay. This inflexibility could have severe economic implications and potential ecological implications.

EPA should not, on one hand say that ecosystem benefits (such as with restoration of oysters) are important and can be counted towards measuring progress towards implementing the TMDL (see Section 4 of draft TMDL, Appendix U). Then on the other hand, say that oyster restoration is akin to "in-stream treatment" and could create a problem meeting local water quality standards in upstream jurisdictions (see Section 6 of the draft TMDL, Appendix U).

At a minimum, EPA should provide the appropriate references for its position on other issues of concern. EPA states "because pollutants are not reduced at or near the source, this strategy [of increasing filter feeder populations] could create a problem with meeting local water quality standards in the upstream jurisdictions" (see draft TMDL, page U-5). EPA needs to clarify this statement and provide information about which local water quality standards would not be met under this scenario.

D. EPA should include a "backstop" TMDL that includes the benefits of modest restoration of all filter feeders.

Accounting for oyster restoration to one-tenth of historical oyster biomass, or a tenfold increase from current estimated conditions, has no less reasonable assurance than other assumptions EPA has employed in the draft TMDL (and for all potential final TMDLs so far presented by EPA). For example, EPA has proposed establishing a TMDL to meet a number of water quality standards (WQSs) restoration variances (proposed and existing), in direct conflict with EPA's own guidance on TMDL development which notes that "States should be aware that a TMDL should be developed to meet the existing WQS, not a temporary variance that is less stringent than the existing WQS"[17]. If EPA is willing to violate its own TMDL guidance, then surely it should also be willing to establish a TMDL based upon a reasonable assumption of oyster restoration in the Chesapeake Bay that is merely uncertain but would not violate TMDL guidance.

[17] EPA, July 21, 2003. Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act; TMDL-01-03. Memorandum from Diane Regas, Director of Wetland, Oceans and Watersheds to Water Division Directors, Regions 1 – 10. http://www.epa.gov/owow/tmdl/tmdl0103/2004rpt_guidance.pdf

A reasonable level of oyster restoration should be assumed in the TMDL and the uncertainty should be dealt with through the appropriate jurisdiction WIPs and subsequent tracking mechanisms through 2-year (or 3-year) milestones, rather than being handed off as strictly an implementation question with uncertain load credits (or debits) to be accounted for by the jurisdictions.

E. EPA needs to ensure that adequate resources, including time and data for WQSTM simulations in which the benefits of filter feeders are included, are provided in subsequent updates of the TMDL.

During the April 5 and 6, 2010 Water Quality Goal Implementation Team meeting, the committee discussed a number of issues related to including filter feeder options in the Bay TMDL. Those minutes state:

- "At 5x current menhaden population we would see bay improvements in chlorophyll-a and D.O., but population cannot be assured
- Current model runs have been done with current populations of menhaden and oysters
- EPA is not willing to project increase in population
- For TMDL purposes, proposing to credit increases in filter feeder population not part of the TMDL but only if a monitored increase is found
- Population generally the same since 1985"

The discussion that follows indicates that there are issues associated with harvesting different classes of oysters and menhaden; issues with assigning "credits" or "debits" when adjusting the TMDL allocations for benefits associated with increased filter feeders; and incentives for obtaining federal funding for restoration. EPA needs to insure that the allocations will be adjusted in the 2011 TMDL update. EPA must also assure stakeholders that adequate federal funding will be provided to insure that the Chesapeake Bay modeling tools are adequate to meet this need for the 2017 update.

References

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